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When the Runway Becomes an Ice Rink

Imagine that you are preparing to fly your Cessna 182RG from your home airport in Gaithersburg, Maryland (KGAI), to Westchester County Airport in White Plains, New York (KHPN). It's a raw, high-overcast winter morning in Maryland, with above-freezing surface temperatures. No precipitation has fallen since a light dusting of snow the previous day, and it has since melted. However, the area forecast calls for IFR ceilings and snow along the route, with a chance of snow turning to freezing rain at the destination within a few hours of your planned arrival time.

Being the careful pilot that you are, you delay your departure until the ceilings have lifted and the precipitation has stopped, keeping you clear of clouds and any risk of in-flight icing.

The flight proceeds uneventfully and 30 minutes from your anticipated arrival at White Plains, you dial in the ATIS and learn that the surface winds are from 130 degrees at 15 gusting to 20 knots, visibility is 10 miles, and the ceiling is 8,000 feet broken. The surface temperature is -2 degrees C. The ATIS concludes with the statement, "Braking action advisories are in effect." You've never heard

this on an ATIS report before, but the weather is acceptable. You continue to the airport and plan to land on Runway 11, which is 4,451 feet long and 150 feet wide. Runway 16 is 6,548 feet long and 150 feet wide, and is the preferred runway for the airport's numerous business jets and airliners.

When you call the tower 15 miles out, the controller advises you that a *Challenger* just landed on Runway 16 and reported braking action as "poor" due to accumulated snow and slush from a heavy squall that passed through the area a short while ago. It has not yet been treated by the ground crew. You were not aware of this because you do not have any onboard weather information, and you have not consulted Flight Watch to update the briefing you received prior to departure. The tower controller asks you to state your intentions.

What should you do?

With a report of poor braking action, you would be well advised to divert to an alternate airport where the runways and taxiways are clear and there are no reports of adverse surface conditions.



Photo by H Dean Chamberlain

Braking Action Advisories

The [Aeronautical Information Manual](#) (AIM) contains guidance (Chapter 4) for pilots on the meaning of braking action reports and advisories. “When available, ATC furnishes pilots the quality of braking action received from pilots or airport management. The quality of braking action is described by the terms ‘good,’ ‘fair,’ ‘poor,’ and ‘nil,’ or a combination of these terms.” The AIM urges pilots to provide as much detail as possible about the conditions they experience during landing, including where on the runway braking was least effective.

The ATIS report will include a braking action advisory when pilots describe braking action as “poor” or “nil,” or whenever conditions are conducive to deteriorating or rapidly changing braking conditions. During the time that braking action advisories are in effect, ATC will issue the latest report to each arriving or departing aircraft. The AIM suggests that pilots should be prepared for deteriorating braking conditions and should request information on current conditions from ATC if it is not offered.

In our example, with a report of poor braking action on the runway, you would be well advised to divert to an alternate airport where the runways and

taxiways are clear and there are no reports of adverse surface conditions. But if you must land

at White Plains for whatever reason, e.g., no good alternate available, low on fuel, and/or deteriorating weather, consider landing on Runway 16. Runway 16 presents a stronger crosswind component, but it

is 2,000 feet longer than Runway 11. It’s a good idea to double or even triple your airplane’s published landing distance when the runway is slick, and aim to touch down on the upwind side of the runway as close to the numbers as you can.

What to Do If You Slide

[Advisory Circular 150/5200-30C](#), Airport Winter Safety and Operations, offers insight into how slick runway surfaces can affect aircraft performance:

“Snow, slush, ice, and standing water on a runway impede airplane acceleration by absorbing energy in compaction and displacement, and by impinging on parts of the airplane after being kicked up by the tires. For airplanes decelerating, slush, snow, and standing water-covered pavements and, especially iced surfaces, hamper deceleration rates due to a reduction in the friction coefficient of the runway and the potential for hydroplaning. Large chunks of ice, from refreezing snow or slush, or deposited from aircraft gear during landings, can cause severe damage to tires, engines, and airframes. Wet snow, slush, and standing water on a runway can also limit operations due to potential structural damage caused by the contaminants impinging on the airplane at high speed.”

Given all of that, the best thing you can do if you realize you’ve encountered slick runway conditions is to reduce power to decelerate and avoid braking—the same response you should have when driving your car. Use all available flight controls (including flaps) to maintain directional control throughout the landing rollout. Do not rely only on nose-wheel steering and differential brakes to maintain control. If a crosswind exists, apply whatever aileron and elevator inputs are necessary to keep the airplane from sliding off the runway during the landing rollout, though if the wind is strong enough or if you encounter ice, this advice may prove impossible to follow. Do whatever you can to maintain aircraft control until you are safely shut down on the ramp.

Assuming you are able to decelerate safely on the runway after landing, taxiing to the ramp may

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pose an even greater challenge. If you're flying a low-winged light airplane, pay extra attention to the height of snow banks. If you slide and get too close to the edge of the taxiway during a turn, your wingtip could impact a snow bank. The challenge is to taxi fast enough to avoid stopping and potentially getting stuck in the snow or slush, but slow enough to maintain directional control with minimal braking.

Other Flight Considerations

When runways and taxiways are covered in snow, it can be difficult for a pilot to identify them during a visual approach. One might look like the other, or grass medians might be confused with paved surfaces. If you are instrument rated, it's a good idea to ask for a precision approach to the landing runway to confirm where the wheels are supposed to go. If you are not instrument rated, consider asking a flight instructor to show you how to tune and use a localizer frequency or how to program a GPS approach with vectors to final. This technique will provide you with straight-in course guidance to the landing runway, which you can use to confirm what you see out the window.

Planning Is the Best Prevention

The best thing you can do to reduce the risk of losing control of your aircraft on a winter-wet runway or taxiway is to avoid operating on slick surfaces. Some pilots use the half-inch rule of thumb for making go/no-go decisions for landing on slush- or snow-covered runways. To do this, you need information about where these conditions are likely to exist. A thorough preflight briefing should include any *Notices to Airmen* (NOTAM) about runway or taxiway closures, snow and ice removal operations in progress, pilot reports (PIREP) of braking action, and, of course, current and forecast weather conditions.

Ice, slush, and snow can turn your aircraft into a sled. Unless your airplane is equipped with skis, it is simply not designed to operate effectively on slippery surfaces. So when the runway glistens, lace up your ice skates—and leave the airplane in the hangar. 

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National Transportation Safety Board Accident Report

Learjet Runway Overrun. On January 28, 2005, a *Learjet* 35A sustained substantial damage during a landing overrun on Runway 19 at Charles B. Wheeler Downtown Airport (KMKC) in Kansas City, Missouri. The airplane was operated by a commercial operator as a positioning flight to Kansas City International Airport (KMCI) in Kansas City, Missouri, with a filed alternate destination of Lincoln Airport (KLNK) in Lincoln, Nebraska. Night instrument meteorological conditions prevailed at the time of the accident.

The flight was en route to KMCI to pick up passengers and continue on as an on-demand charter but diverted to KMKC following the closure of KMCI. KMCI was closed due to a McDonnell Douglas MD83 sliding off a taxiway during an after landing taxi on contaminated runway and taxiway conditions.

Following a precision approach and landing on Runway 19 at KMKC, the *Learjet* 35A slid off the departure end of the runway and impacted airport property and terrain. The jet was operated with inoperative thrust reversers as was allowable by its minimum equipment list.

About an hour before the accident, Runway 19 was reported as being covered with a half inch of wet snow. About 17 minutes before the accident, KMKC began snow removal operations. About 7 minutes before the accident, the KMKC tower instructed the snow removal vehicles to clear the runway for inbound traffic. The tower was advised by airport personnel that Runway 19 was plowed and surface conditions were one-quarter inch of snow.

While inbound, the *Learjet* 35A requested any braking action reports from the tower. The first airplane to land was a Cessna 210 *Centurion*, and the pilot reported braking action to the tower as "moderate," which was then transmitted by the tower as "fair" from a *Centurion* in response to the *Learjet* 35A's query. The Cessna 210 *Centurion* pilot did not use brakes during landing and did not indicate this to ATC during his braking action report.

The *Learjet* 35A crew calculated a landing distance of 5,400 feet. Runway 19 was 7,002 feet long by 150 feet wide, grooved asphalt.

The National Transportation Safety Board determined the probable cause of the accident as the contaminated runway conditions during landing. Contributing factors were the operation of the airplane without thrust reversers, flight to the planned alternate airport not performed by the crew, and the insufficient runway information. Additional factors were the airport property and terrain that the airplane impacted.